SIEMENS

SIREMOBIL Iso-C

SP

Installation- and Setting Instructions

Area dose product measurement device

Valid for
SIREMOBIL Iso-C
and
SIREMOBIL Compact L from Serialnumber ≥3000

English
Print No.: SPR2-230.033.04.03.02
Doc. Gen. Date: 06.05
Replaces: SPR2-230.033.04.02.02

Validity of these instructions

These instructions are valid for the installation of an area dose product measuring device 028 29 054 on the systems
SIREMOBIL Iso-C and
SIREMOBIL Compact L as from serial number 03000.

Documents required

SIREMOBIL Compact L and repectively SIREMOBIL Iso-C system binder including the general safety information.

If there is a laser targeting device: Setting and adjustment instructions for the Laser Targeting Device.

Parts required

Installation kit: Area dose product measurement device

Measurement and auxiliary devices required

Service PC	
Service PC-Host interface cable e.g.	99 00 440
SIREMOBIL service software (Log book)	
Safety tester e.g. Bender Unimet 1100	51 38 727
Dose measurement device e.g. PTW-DIADOS	97 17 612 Y0388
Center cross e.g.	96 60 051 RE999
Silicon sealing compound	20 49 716

Tools required

Standard service kit

1 set of Allen keys

Safety information

General safety information

⚠WARNING

Danger of injuries, death or material damage.

Note

- the product-specific safety notes in these instructions,
- the general safety information in the document TD00-000.860.01...
  and
- the safety information in accordance with ARTD Part 2.

Non-compliance can lead to death, to injuries or to material damage.

Safety Information, Electrical

⚠WARNING

Electrical safety!
Non-compliance can lead to severe injuries and even death and to material damage.

After opening the cover panels, the parts under voltage are accessible. To avoid risks, switch off power to the system prior to opening cover panels. Pull out the power supply plug.

If an uninterruptible power supply (UPS) is installed in the system, the power supply of the UPS must be switched free of voltage in addition or the voltage output plug must be pulled out.

If work has to be performed under electrical voltage, the general safety information according to TD00-000.860.01... must be complied with.

⚠CAUTION

Electrical voltage!
Non-compliance can lead to material damage.

When working on the system, ESD regulations must be observed.

Safety Information, Mechanical

⚠WARNING

Danger of injuries on mechanical parts!
Non-compliance can lead to slight to medium injuries, especially of the hands.

The C-arm of the system is manufactured from carbon fiber composite material (CFK). In the case of damage to the carbon fiber structure, for example caused by collision or by cutting or scraping tools, individual carbon fibers or carbon fiber bundles can stand out and on contact cause injuries to the skin or penetrate into the tissue of the hand.

Before starting work on the C-arm, make sure that there is no damage to the carbon fiber structures (visual inspection).

If smaller superficial damage is detectable in the painted area or in the area of the running surface edges of the C-arm, wear working gloves and remove any projecting carbon fibers. Then carefully rub the damaged places flat with fine emery cloth and close the damaged surface with paint. A spray paint in the color of the C-arm can be used for this purpose (See Service Tool Catalogue). Remove any carbon fibers lying in the C-arm profile with a damp sponge or cloth.

If greater damage to the carbon fiber structure indicating general or large-scale destruction of the carbon fiber structure (e.g. crack formation or flaked off places in the running surfaces with torn carbon fibers) can be detected, then replace the C-arm.

⚠CAUTION

Danger of injuries on mechanical parts!
Non-compliance can lead to slight to medium injuries, especially of the hands.

After covers are opened, parts such as flat plugs, threaded bolts, cut-off cable ties and edges of components can be touched which, if care is not taken, can cause crushing, scrapes and cuts to the skin, particularly to the hands.

Perform the particular work steps with special care and attention to detail.

If needed, wear working gloves.

⚠CAUTION	**Danger of injuries on mechanical parts!** **Non-compliance can lead to slight to medium injuries, especially of the hands.** **Before starting service or maintenance work, check the system by a visual inspection for mechanical safety defects which in the case of inattention could lead to injuries. For example, projecting, bent or broken parts / covers, damaged plugs or cables.** **Remove existing safety defects by replacement or repair of the damaged parts.** **Perform the particular work steps with special care and attention to detail.** **If needed, wear working gloves.**

⚠CAUTION	**Danger of burns on hot parts or components!** **Non-compliance can lead to slight to medium injuries, especially of the hands.** **After opening the cover panels, parts and components (e.g. power components, cooling units, electromagnetic brakes) are accessible that can have temperature of > 50C during operation. To avoid burns, switch the system off prior to touching parts or components and let them cool at least 5 minutes.**

Safety Information, Risk of Infection

⚠WARNING	**Danger of infections due to pathogens!** **Non-compliance can lead to severe injuries and even death.** **This product can be contaminated by infected blood or other bodily fluids.** **Avoid all contact with blood or other bodily fluids!** **Strictly observe the safety information in ARTD-002.731.37... regarding prevention of infectious diseases during customer service calls.**

Safety Information, Radiation

⚠WARNING

X-ray radiation!
Non-compliance can lead to illnesses, irreversible damage to body cells and the genotype, severe injuries and even death.

In work on the system in which radiation must be released, the radiation protection directives and the rules for radiation protection according to ARTD 02.731.02 must be complied with.

Please note:

- Use available radiation protection devices.
- Wear radiation protection clothing (lead apron).
- Keep your distance from the radiation source as large as possible.
- Release radiation only if necessary.
- Set radiation activity as low as possible.
  (Low kV and mAs values, short radiation time)
- Release radiation for as short a time as possible.

Checks in which radiation must be released are identified by the radiation warning symbol.

Protective conductor resistance test information

Observe the instructions in the safety rules for installation and repair (ARTD-002.731.17 ...).

The protective conductor resistance must be measured after every intervention in the system.

However, documentation of the measured values is required only during periodical safety checks.

If parts / components that can decisively influence the protective conductor resistance are replaced (e.g. replacement of the mains cable, replacement of the ON/OFF assembly, replacement of multi-core connection cables, which also create the protective conductor connection between parts of the system (e.g. monitor cable or C-arm cable)), or if protective conductor connections have been repaired, then the protective conductor resistance must be measured. The values must be documented and assessed in the protective conductor resistance report.

NOTE

Evaluate the results by comparing the first measured value to the corresponding values documented during preceding maintenance procedures or safety checks.
A sudden or unexpected increase of the measured values, even if the limit value of 0.2 ohms is not exceeded, indicates errors in the protective conductor connections. (Protective conductor or contacts).

The measurement must be made according to DIN VDE 0751, Part 1 (see ARTD Part 2). In this case the protective conductor resistance in the normal operating condition to all conductive touchable parts of the system must be measured.

Make sure that control cables or data cables between the components of the system do not imitate any protective conductor connection.

During the measurement the power cable and additional connection cables which also create the protective conductor connection between parts of the system (e.g. monitor cable between basic unit and monitor trolley) must be moved section by section to detect broken conductors.

The protective conductor resistance may not exceed 0.2 Ohms.

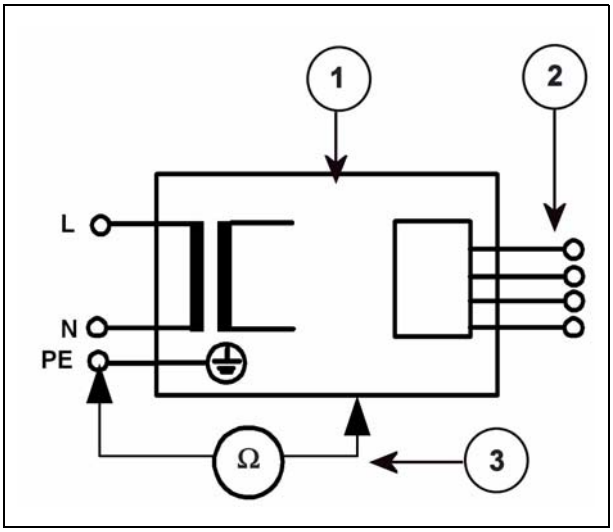

Fig. 1 Measuring circuit for measuring the protective conductor resistance in systems that are separated from the power supply, according to DIN VDE 0751-1:2001-10, Fig. C2.
1 = System
2 = Application part (not present)
3 = Measuring arrangement (integrated in the measuring instrument)

Installation

- Disconnect the SIREMOBIL power plug.
- Remove the SIREPHOS cover.

Without the laser targeting device:

- Attach the area dose product measurement device to the SIREPHOS using the screws included in the packaging.
- Connect the interface cable already integrated in the cable harness to the area dose product measurement device and lock it in place.
- Refit the SIREPHOS cover hood and seal the joints with silicone sealing compound.

With the laser targeting device:

- Remove the laser targeting device from the SIREPHOS by removing the screws.
- Mount the area dose product measurement device to the SIREPHOS.
- Reattach the laser targeting device.
- Connect the interface cable already integrated in the cable harness to the area dose product measurement device and lock it in place.
- Check the laser targeting device according to the adjustment instructions and, if necessary, adjust it.
- Refit the SIREPHOS cover hood and seal the joints with silicone sealing compound.

Memoskop Programming

NOTE	**After selecting the "Disable dose rate selection in User Set Up" parameter, the "Storage of dose on disk" and "Dose on hardcopy output" parameters become available in the Memoskop User Setup and visible to the customer.**

- Turn on the SIREMOBIL and wait for the start-up.
- Insert the Memoskop parameter disk (see System folder Register 10) in drive A of the service PC.
- Start the Memoskop service program.
- Click the "Get from Memoskop" button in the main menu. The parameters are transferred from the Memoskop to the Service PC.
- Select the "Others" menu.
- Select "Disable dose rate selection in User Set Up". The Check button is not marked.
- Select "Storage of dose on disk". The Check button is marked.
- Click on the "Back" button. The "Others" window closes.
- Select the "Hardcopy Setup" menu.
- Select "Dose on Hardcopy output". The Check button is marked.
- Click on the "Back" button. The "Hardcopy Setup" window closes.
- Click on the "Put to Memoskop" button in the main menu. The parameters are transferred from the service PC to the Memoskop and saved.
- Select the "File" menu.
- Select the sub-menu "Save" and save the parameters on disk.
- Exit the Memoskop service program.
- Turn the SIREMOBIL off and the on again to reset the serial interface.

Calibrating the area dose product measurement device

NOTE	**This adjustment is used to calibrate the area dose product measurement device of the SIREMOBIL display.**

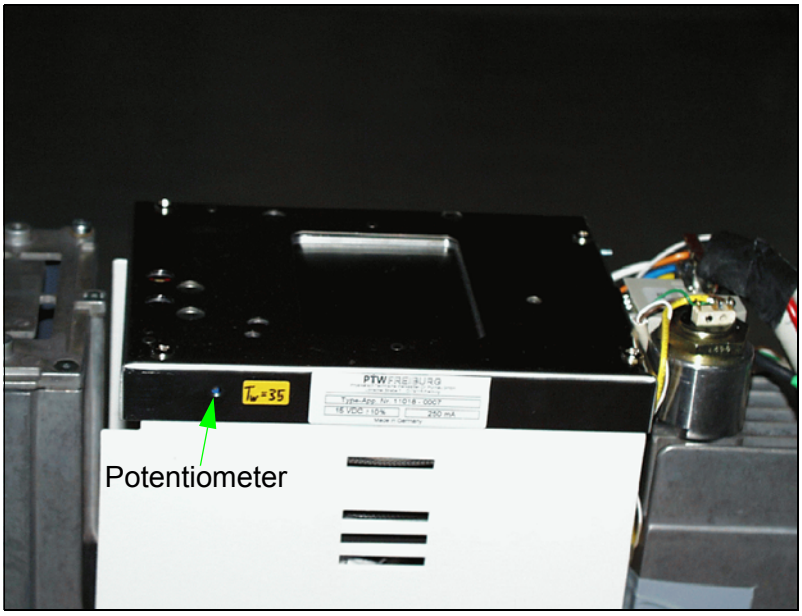

Fig. 2

Parameter "CONSTANT (Qt * Kg) = T_w"

- Read and record the T_w value shown on the electronics unit of the area dose product measurement device.

Programming

- Connect the service PC to the serial interface of the SIREMOBIL .
- Start the service program.
- Select the Adjustment, Parameter menu.
- In the Combo box "Parameter Groups:", select "Diamentor" .
- Click on "Get from Unit".
- The Parameter "1. Diamentor Existing" must be on YES .
- Select parameter "2. Constant (Qt * Kg)" .
- In "Value Actual:"field, enter the parameterT_w.
- Click on "Set Value".
- Click on "Put to Unit" .
- Click on "Save to File".

NOTE	**You must exit the service program with "Logoff" and "Quit" to store the modified parameters to disk as a new file.**

Checking the programmed values

NOTE

Checking the programmed values will activate the self-test in the electronic system of the area dose product measurement device. This serves to recalibrate the electronic system of the area dose product measurement device.

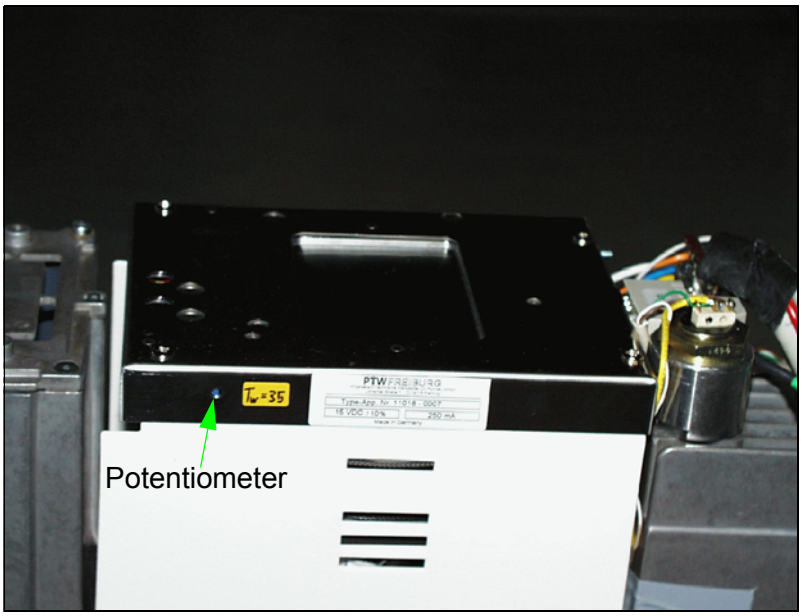

Fig. 3

Prerequisites

The T_W value is already programmed. Refer to Programming.

- Connect the service PC to the serial interface of the SIREMOBIL .
- Start the service program.
- Select the Adjustment, Calibrations menu.
- Click "Yes" to answer the query.
- In the Combo box "Function Group:", select "Diamentor".
- In the window "Available Functions" , select the line "Start Diamentor Test" and click on "Execute" .
- Close the pop-up window with the display "Result 0" by clicking the OK button.
- The tested T_W value is displayed on the monitor of the SIREMOBIL .
- This value must match the programmed CONSTANT (Qt*Kg) value. Tolerance: +/- 5 %.
- By pressing the -0- key (reset key for fluoroscopic time) the test is repeated and is displayed again on the monitor.
- The potentiometer (fig.2) of the area dose product measurement device can be used to adjust the test value to the programmed value (Qt*Kg).

- After the adjustment, select "Stop Diamentor Test" on the service PC and click on "Execute".
- The test is ended.
- Check the accuracy of the area dose product measurement device. Refer to the next page.

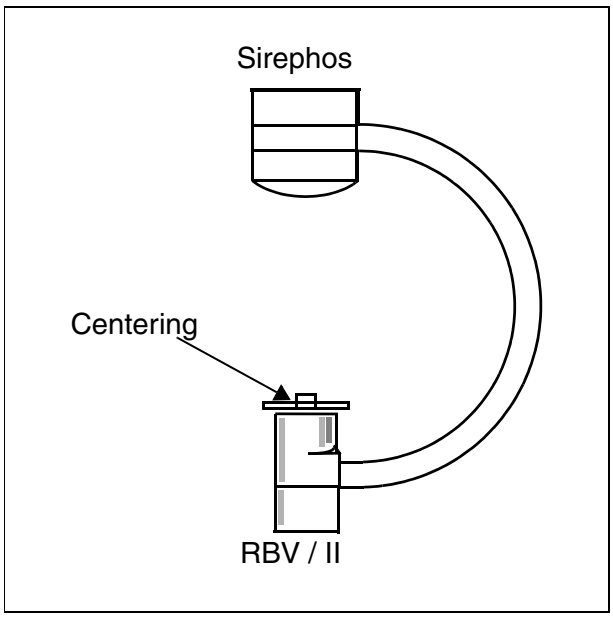

Fig. 4

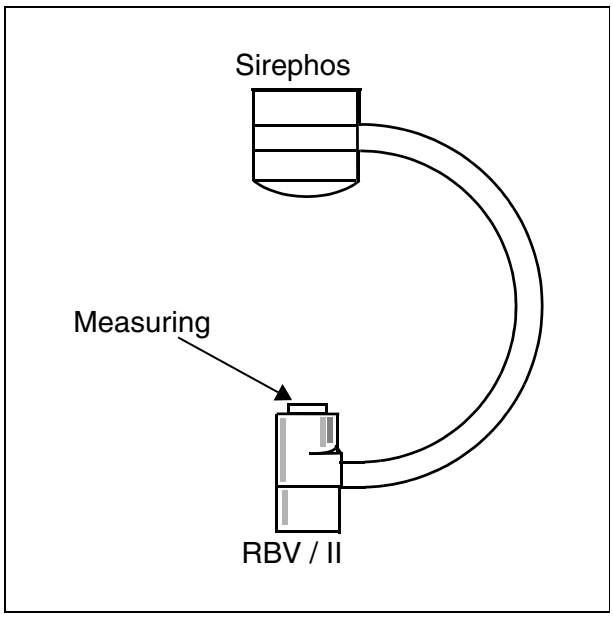

Fig. 5

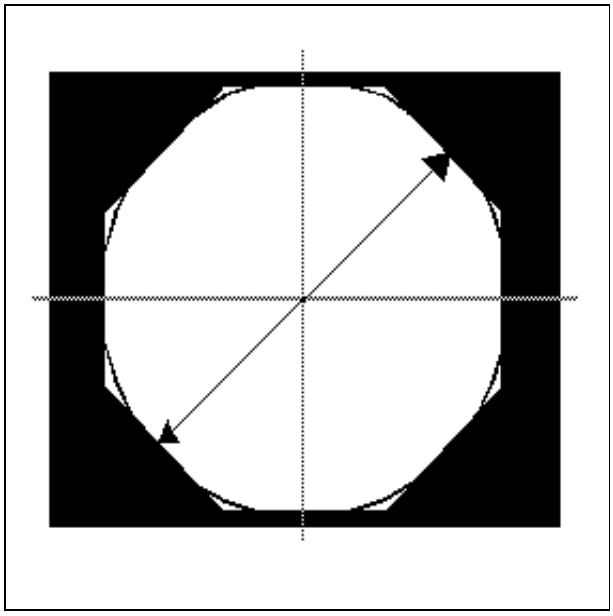

Fig. 6

Checking the accuracy of the area dose product measurement device

Prerequisites

The calibration of the area dose product measurement device has already been performed.

Preparations

- Attach and center the center cross on the I.I. (Fig. 4).
- Select survey format.
- Select KV mA curve plateau HC1.
- Attach and center the small ($1cm^3$) dose measurement chamber of the dose measurement device (Dali, Nomex ...) or the semiconductor detector (Diados) onto the image intensifier (Fig. 5).

- Release fluoroscopy briefly, adjusting the iris on the radiation field to a format of approximately 15 cm.

NOTE

The radiation field must cover the entire area of the dose measurement chamber respectively the semiconductor detector of the dose measurement device.

- Do not make any further adjustments to the iris.
- Record the diameter (Fig. 6) of the octagonal area of the radiation field.
- Remove the center cross.
- Select kV STOP and enter 70 kV.

Dose measurement

- Press the >0< key twice to reset the area dose product on the Siremobil monitor to 0 .
- Reset the dose measurement device (Dali, Nomex ...) to 0 .

- Release fluoroscopy several seconds. The measured dose K_E should be high enough that the uppermost measurement range of the dose measurement device is utilized fully; if necessary, reset the area dose product display on the Siremobil and the dose measurement device and repeat the measurement with a different fluoroscopic time.
- Record the measured dose.
- Record the area dose product displayed on the Siremobil monitor (FDPa).

Calculating the area dose product

- To calculate the measured area dose product :
  (measured area dose product FDPg) = (measured dose K_E) * $(\text{diameter})^2$ * 0.829

Evaluation

Calculate the deviation between the measured area dose product and the displayed area dose product:
The deviation must be < 0.3 .

Deviation = [(displayed area dose product FDPa) - (measured area dose product FDPg)] / (measured area dose product FDPg)

For deviations > 0.3 , the area dose product measurement device must be replaced.

Concluding steps

- Reinstall all the covers.
- Perform the protective conductor measurement as specified in ARTD-002.731.17.
- Observe the information on protective conductor testing in these instructions.
  Perform the protective conductor test according to ARTD-002.731.17.

  ➪ The protective conductor resistance may not exceed 0.2 Ohms.
- Perform partial acceptance tests in accordance with country-specific regulations.

Changes to previous version

Entire instructions extended to SIREMOBIL Compact L as from serial number 3000.

Safety information newly inserted.

Required measuring equipment and auxillary devices revised.

Check of the programmed values revised.

Check of the accuracy of the area dose product measuring instrument revised.